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29 July 1957

CMCC Doc. No. 151X5.647  
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Dear Dick:

We are forwarding herewith eight copies of Monthly Progress Letter No. 11, covering work performed on System No. 4 during the period extending from 11 May to 18 July 1957.

Sincerely,

Burt

Enclosures:

CMCC Doc. No. 163X5.45  
Copies 1-8 of 12

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Progress Letter No. 11

Contract No. A-101

System 4

11 May to 18 July 1957

CMCC Document No. 163X5.45

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(This document contains a total of 5 sheets,  
including this title sheet.)

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1. General

During the period covered by this progress letter, the following work was performed:

- (1) Unit and system tests were completed on the first production model. These tests included two unattended runs of approximately 10 hours each.
- (2) The first production model was delivered to the field test site and the first flight test was effected on July 12.
- (3) Fabrication and assembly of the second production model was essentially completed and system testing was started.
- (4) Design work was started on the preflight test set.

2. Flight Test

a. The first production model of the system was delivered to the field test site on June 13 and the first flight test was made on July 12. The test was conducted at medium altitude and was intended to demonstrate basic environmental suitability of the equipment. Duration of the flight test was slightly over two and one-half hours.

b. The system was complete at the time of the flight test with the exception of the Band 1A receiving equipment. Results were generally satisfactory, and signal activity was noted for all receiving equipments with the exception of the Band 4 receiver, which suffered a power failure, and the Band 2 receiver, which suffered mechanical difficulties. The audio recorder functioned satisfactorily until a main power fuse was blown approximately one hour and 45 minutes after the equipment was energized. Malfunction of the video recording equipment occurred after approximately fifteen minutes of operation.

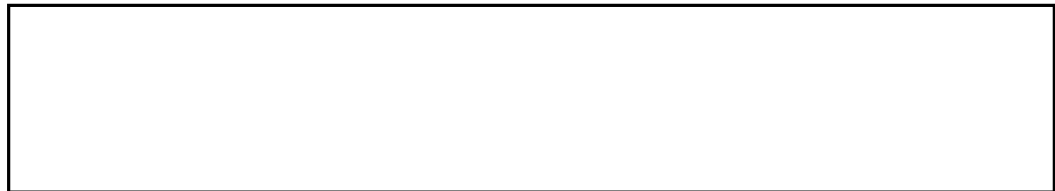
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c. The only major component failures encountered during the test occurred in the camera motor and some of the blower motors. Failure of the blowers was apparently due to loss of a fuse in one leg of the three-phase 110-volt supply. Minor component failure occurred in the indicator, but there were no circuit failures in any of the other units.

d. The second flight test of the first production system is scheduled for July 19.

3. System Modification



At the time this modification was effected, it was planned to utilize suitable multi-couplers to provide the proper impedance matching and maximum isolation between receivers. The multi-couplers were not available at the time of system testing on the first production model, and no isolation was provided between receivers. In consequence, it was found that the Band 3 receiver could lock on to local-oscillator radiation from the Band 2 receiver when both receivers were connected to the same antenna. However, the system was released for the start of field tests and it was planned to incorporate the multi-couplers prior to final delivery.

b. Since the initiation of field tests, a multi-coupler has been received from the vendor and has been tested. The design is satisfactory from the standpoint of impedance matching, but does not provide adequate isolation in the transition region between Bands 2 and 3. On the basis of laboratory measurements it appears that an additional 20 db of isolation would be required to prevent cross-talk.

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c. As a temporary measure the antenna switching circuits will be modified so that it will be impossible for these receivers to be connected to the same antenna at the same



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4. Production

During the report period, fabrication of the second production system was completed and system testing was initiated.

5. Preflight Test Set

a. Design work on the preflight test set has been started. The test set will consist of the following three mobile units:

- (1) receiver test unit
- (2) terminal equipment test unit
- (3) tape transport test unit

In addition to its primary function, the preflight test set can be utilized for general maintenance and repair of all portions of the system.

b. The receiver test unit will be housed in a large mobile rack which will hold a receiver test set, test antennas, and a variety of commercial test equipment such as signal generators and power supplies. A number of conveniences such as adjustable lights, spare parts drawer, and cable storage will be incorporated to facilitate system maintenance.

c. The terminal equipment test unit will be mounted in a standard relay rack. Included in the rack will be a commercial oscilloscope, a commercial pulse generator, and circuits for

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checking the audio and video programmer. In addition, the rack will contain power supplies to deliver the necessary voltages to the terminal equipment during bench tests. Most of the circuitry will be transistorized and packaged in standard modules as described in MIL-E-19600. Many of these modules will be identical to those in the "M" and "N" racks of the System 4 data reduction equipment.

d. A separate mobile unit will be provided for checking the operation of the System 4 tape transport. This unit will provide a space for mounting the transport if it is necessary to remove it from the system for test and repair.

#### 6. Planning

During the next report interval the major effort will be directed toward:

- (1) completion of unit and system testing for Channel 1A
- (2) minimizing of local-oscillator coupling between Bands 2 and 3
- (3) completion of flight testing of the first production model, and delivery for operational use
- (4) completion of system testing of the second production model, and preparation for flight testing
- (5) release of engineering information for the preflight test set and fabrication of the first deliverable model.

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